

PHILOSOPHICAL TRANSACTIONS.

March 25. 1669.

The Contents.

A Preface to the Fifth year of these Transactions, which is herewith begun. The Description of an Instrument for drawing any Object in Perspective. An Observation of Saturn, rectifying some former Observations of that Planet. An Extract of a Letter, written from France to the Publisher, concerning the Ordering of Melons. An Account of two Books. I. Renati Francisci Slusii MESOLABUM, 2^a Editio anctior. II. Tractatus de CORDE, item de Motu & Colore SANGUINIS, &c. A. Richardo Lower, M.D.

A P R E F A C E

To this Fifth Year of the Transactions.

IT may perhaps be expected, that here at the Entrance into the Fifth Year of these Philosophical Communications, something should be prefac'd, as hath been done formerly for an Introduction into each of the Four preceding years, beginning always (according to the English Account) in the Month of March. Briefly then, I shall make a few fresh Reflections on what is past, to the purpose of Impressing some few things perhaps not altogether inconsiderable; And thence offer a Prospect of what may be hoped to be the Product of our future Endeavours, as God shall vouchsafe to prosper them.

In the first Volume, containing the Transactions of Two Years, 1665, 1666. though we were fatally interrupted by the Plague,
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Wars, and the horrible Conflagration of our Metropolis; yet we then made an Attempt of laying some Foundation for the Improvement of real Philosophy, and for the spreading of Useful knowledge; in publishing Advices and Directions for the writing of an Experimental Natural History; in pointing out Essays, Patterns and Exemplars, that have hitherto been designed in that kind; in giving notice of divers Artificial Engins and Instruments, which may be helpful for the further Discoveries of Nature, or for the greater performances of Art. We sought out, how far Art had then arriv'd towards the perfecting of the Microscope; and by what means that curious Instrument might be advanc'd; and what Informations it would afford us, either upon the view of minutest Bodies; or of the Texture, Surface, Porosities, Smoothness or Inequalities of other Bodies, that were in our power for such approaches. The like care we had for Telescopes, by what Operations, Engins, and Applications they might be further improv'd; and what was the most, they could thus far perform. Then we related the Finding out of the Rotation of some of the Planets, and the Changeableness, and Seasons of absence, or Obscurity in some of the Fixt Stars, or such as seem'd to be of their Train. And never, I think, were Comets so chased, their Figures and Appearances so detected, their Motions almost reduced to Rule, and in a manner predicted; the Solar Eclipse in several and distant places carefully calculated. And not to recite here, what was attempted and done by Burning-Glasses; I shall but name the Instruments devis'd to Measure the Weight and the Changes of Weight of the Air, and other ascending and descending Fluids, either with the Pressure of the whole Atmosphere, or of smaller parcels freed from that Pressure; I mean the Baroscopes, and the Pneumatick Engins. There were also offer'd Hygrosopes, to note the degrees of Drought or Moisture in the Air; Thermometers to measure the degrees of Heat and Cold; and an Instrument to graduate Thermometers to make them Standards of Heat and Cold; an Instrument to measure the Refractions of Liquors of all kinds, for establishing the Laws of Refraction; Hydrostaticks to measure the Weight of Liquids, and divers other Contrivances to find out the Statical position, tendency and gravitation of Liquids in all parts. Besides, Engins to break the hardest Rocks; Huge Wheels, and other Engins for Mines described; To raise Winds, by the fall
of

of Waters; An Instrument to examine the greatest Depths of the Seas; Another, to try for fresh waters in the bottoms of some Seas; Pendulum-watches to ascertain Longitudes. But I must refer to a greater store of such useful Inventions commemorated by M^r Sprat in his History of the R. Society.

Neither had I here mention'd these, but to give this Advertisement; That sometimes one of these Instruments may open a fair Portal for more Volumes of the most obliging Philosophy, than can be absolv'd by many hands in some Ages. It will not be meer Preface, but closely agreeable to the Intention of these Tracts, if I here instance one particular, which may possibly seem to some of the lowest value, and yet may chance to prove of greater importance, than at first we are apt to imagine. I will name good Scales both of the nicest kind's and some of a stronger frame. Now this I would represent. 'Tis certain, some Bodies do increase their weight in a strong Fire: See the Experiment in the said Hist. of the R. Society, p. 228. And Honorable M^r Boyle hath proved, That even Solid and Coldest Bodies have their Atmospheres; Some their Electricity; and some their Magnetismes: And 'tis palpable, that some draw more Aliment, either from the Earth, or from subterraneous Liquors, or Spirits, or from the Nutritious parts of the Air, or other Influences, which descend through the Air, than they expend in their Atmospheres; And perhaps more at certain State times, till they have acquired their due Increment. This being observ'd, it seems easie to devise, How to examine by Scales, Glasses, and such slight furniture, whence Vegetables, many kinds of Stones, Metals, and other Minerals, have more or less of their Increment, and whence they obtain the stronger Fermentation, which conserves them, or promotes their perfection in their kind: Whether Glass, or what other Materials, do obstruct or retard the resort of any or all of these Spirits, Heats, or Influences: Whether Evergreens, the most fragrant or strong-scenting, hot or cold Plants, draw more of their substance from the free Air; and which draw more from the subterranean supplies. And so we may examine Earths, and Minerals. We see many Tracts of Land, which yield peculiar Ferments, sometimes Vitriolate Earth, sometimes Aluminous, sometimes Nitrous, sometimes common-Saline, healing Bolus's, and Earth proper for Fullers, Tobacco-pipes, &c. Sometimes the Ferment is so hot, as to hollow the surface faster than can easily be

allay'd by Mixtures of a more sullen soyl. And sometimes the Natural surface is so sullen, as to swallow and devour the richest Compost, before it rewards the industrious Husbandman or Gardener: And some do highly pretend to make by Art Nitri-fodinas perpetuas; to devise the Magnets, which shall draw to our Use the Alimential Nitre of the Air. I shall not stay to engage for or against either of these: but by those curious Utensils we may soon examine, What may be done in good earnest, and how far clear Experiments will answer to those alluring promises. And though we should fail of the Particulars, yet thence we may chance to dive into some Secrets o' very useful Philosophy, and find other Influences, than are either Electrical, or in the common sense Magnetical, but pregnant to disclose the Causes, and to remove the Defects of Fertility, and to impart other no less valuable vertues. For there are more kinds of Vegetables than are commonly so call'd, or so consider'd; as our History of Osteo-colla, and the beautiful Stone-plants growing on the hard Rocks in Jamaica (to omit many other Instances) do testifie. And we see by Experience, that peculiar Earths, Fullers Earth, Tarras for Vessels, and some kinds of Stones, and of Mineral Ores, have their real Increase of Substance in their times of Seasons, and proper places. Many Noble Persons are Lovers of Gardens, and are willing to entertain Exoticks; and are provided of the Rocks, Grots, and Crypta's: Possibly, if they shall have a desire to search into the Causes of these over-hot ferments, and of the slow-pac'd duller Earth, they may happily find unexpected Treasures in their own private Inclosures. The Spade and Pick-ax will shew the proximate Causes, or at least some of the Concomitants of every kind of Fertility, and of every kind of Barrenness; and the Scales will distinguish real and substantial growth, and the seasons of it, from deceiving Expansions: And then, by Arches and Vaulis, by opening Springs, by heaps of Stones, here of Lime-stones, there of Marl-stones, and in severals of Pebbles, white and black Flints, Marcasites, Mineral Ores, Magnets, and Bodies of the strongest Electricity, where they may be had, some laid as in their Natural Beds, and some dislodged in an unkind posture, we may Artificially frame such subterraneous Furnaces and Stoves, as may, by a calm Process, afford us some of the Wonders of Divine Chymistry. And thus we may have refrigerating Conservatories for cooling Lenitives. Here we may seed moist-
ning,

ning, drying, oily, acid, embalming, tartarous, and every other sort of Steams and Vapours: And what every Maß effects upon the Confiners at what seasons, and at what distance, the Scales and other Implements may detect. The Ingenious Sanctorius hath not exhausted all the results of Statical Indications. They may serve to calculate or weigh all sorts of Transpirations, to discriminate Generative, Nutritive, Sana'tive, Restorative, and Benigne, from Maleficate and Noxious Spirits; and may instruct us how to guard from what is hurtful, and how to retain that which is congenial. This Memorandum was due to those Worthies, who have contrived these Philosophical Tools; and who, in despite of Calumny and Raillery, have in these and many other respects deserv'd as great Names (I must say this softly) as they, who have adorn'd the best Records of foregoing Ages. But to return; Here in this first Volume were also dispatch'd Enquiries and Directions for all Travellers by Sea and Land, for our Correspondents and all Ingenious persons residing in the more famous parts of the World; to review, and return a safe Testimony of all such Observables of Nature and Excellencies of Art, as carry the great st fame, or seem most considerable for Use or Instruction. We have furnisht particular Inquiries for Mines, for Seas, for Springs, and for the Effects of the late Invention of Transfusing Blood, and Medicated Liquors into the Veins of Animals.

In the second Volume, containing the Transactions of the Year 1667. we spread somewhat more largely abroad the Inquiries proper for more places of principal note; and then we received from our Co-respondents, and publish'd, many not un-instructive Answers. And here were added more Instruments of Art, some newly devised, as an Instrument for Measuring the Diameters of Planets to great exactness. We offer'd fuller Directions for Sea-voyages; collected divers Anatomical researches; relate many odd effects of the Transfusion of Blood, and of Medicins into the Veins of Animals; a deeper Investigation and further Accompts of Respiration; a dissected Animal preserv'd alive by the Wind of Bellows; the Influence of Air upon the Life and Growth of Vegetables, upon Luminous Bodies, and Burning Coals, &c.

In the third Volume, for the Year 1668. (besides a good store of Instructive Answers to the former Inquiries, and some further Progress in the disclosures of Nature) hath been introduc'd something of Algebra,

Algebra, and other branches of the Mathematicks and Mechanicks, for the use of those that are studious in those Noble Arts, as well to direct in the best Methods, and to detect Erroneous adventures, for the behoof of generous Beginners, as for the satisfaction and further encouragement of them that have attain'd higher accomplishments.

Also, in each of these Volumes, hath been given the Breviate and Substance of such Philosophical Writings, as came abroad, and were thought of good worth. And all along we have interspers'd many Histories, Philosophical Observations and promiscuous Experiments.

And now, I think, we may take our Prospect, and see, that we have got more ground in our second Volume than in the first; and more yet in the third than in either of the former; whence we take the liberty to ominate well for the future. Yet in all this I assume nothing to my self, but give all what is due to the merits of my generous Correspondents. And all that have affections for Arts and Sciences may rejoyce to see the late Proficiency of the Ingenious and Nobler Students in both our famous Universities, and in all the Universities of Christendom. The Ingenious French have drawn the same Yoke with us, in publishing their Journal des Scavans; and the Romans have followed our Example in their Giornale de Letterati. And doubtless all Civil Nations, who have a Gust for useful knowledge, will, in good time, drive on this Example; and then, as the Light increaseth, and runs on, we shall in a like proportion become so many mutual Ayds to each other: And this will hopefully redound to the General good of Mankind.

I doubt not but the Reader will pardon the Prolixity of this Preface, since, as was promis'd, it is not onely Preface, but bears a part of my main business, which is, to excite and animate the Industry and free Communications of others; of some of whose Effects take for the present the Specimens following.

The Description

Of an Instrument invented divers years ago by Dr Christopher Wren, for drawing the Out-lines of any Object in Perspective.

See *Fig. I.* wherein *A.* is a small Sight with a short arm *B.* which may be turn'd round about, and mov'd up and down the small Cylinder *CD.* which is screw'd into the piece *ED.* at *D.* this
piece